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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,674	10/19/2001	Yan Zhou	021040-000300US	3848

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EXAMINER

PETKOVSEK, DANIEL J

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 03/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/083,674

Applicant(s)

ZHOU ET AL.

Examiner

Daniel J. Petkovsek

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on amendment filed January 19, 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-89 and 96-101 is/are pending in the application.
- 4a) Of the above claim(s) 1-36 and 47-89 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-46 and 96-101 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on August 16, 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This office action is in response to the amendment filed January 19, 2005. In accordance with the amendment, claims 42-44, and 46 have been amended, claims 90-95 have been formally canceled, and new claims 96-101 have been added. Claims 1-89 and 96-101 are pending.

Claims 1-36 and 47-89 have been withdrawn from consideration.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 37, 38, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Hornbeck et al. U.S.P. No. 6,775,453.

Hornbeck et al. U.S.P. No. 6,775,453 teaches (Fig. 10, column 9, line 66, through column 10, line 63) an optical waveguide 20 comprising: a substrate 24, a lower cladding 26, a non-cylindrical waveguide core 60, and an upper cladding 26, the waveguide core 60 having a refractive index that is graded in the y-coordinate and gradually decreases from a maximum effective refractive index at the core's center 32 (see column 10, lines 1-16), which clearly, fully meets Applicant's claimed limitations. Regarding claims 38 and 40, the refractive index is also graded in the x-coordinate, having a maximum refractive index at the core 32 and gradually decreasing outward.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 39, 41-46, and 96-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hornbeck et al. U.S.P. No. 6,775,453.

Hornbeck et al. U.S.P. No. 6,775,453 teaches (Fig. 10, column 9, line 66, through column 10, line 63) an optical waveguide 20 comprising: a substrate 24, a lower cladding 26, a non-cylindrical waveguide core 60, and an upper cladding 26, the waveguide core 60 having a refractive index that is graded in the x-coordinate and y-coordinate and gradually decreases from a maximum effective refractive index at the core's center 32 (see column 10, lines 1-16).

Hornbeck et al. '453 does not explicitly teach different embodiments in which a certain coordinate (either x or y) is constant in effective refractive index through the entire coordinate direction, while the opposite coordinate (either y or x, respectively) is graded, gradually decreasing from a maximum effective refractive index at the core's center (claims 39, 41, and 45). It would have been an obvious matter of design choice to create a waveguide, based upon the explicit teaching of Hornbeck et al. '453, in which the refractive index was graded in either the x-coordinate or the y-coordinate, but not both, since the one-directional graded index does not solve any problem or is for any particular purpose and it appears that the invention would perform equally well (maintaining efficient propagation of the optical signal within the center of the waveguide core) with either embodiment, or the presently disclosed subject matter of

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Hornbeck et al. '453. Again, Applicant is silent to the criticality of such, and does not point to any distinction in the arguments filed January 19, 2005.

Regarding claims 42-44, 96, 97, 99, and 100, Hornbeck et al. '453 discloses the claimed invention except for the steps ranging from about 0.001 to about 0.014, having an average value of about 0.007, or having an average value of about 0.003 in steps near the center. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a variety of steps/gradations in the development of a graded index core propagation region, since it has been held that where the general conditions of a claim are disclosed in the prior art (i.e. the steps of Hornbeck et al. '453), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 223. Creating a number of steps at different refractive intervals is simply discovering the optimum or workable range of the refractive index steps as disclosed by Hornbeck et al. '453.

Regarding claim 46, 98, and 101, it is well known to couple optical waveguides together (such as the waveguide of Song et al. 6,339,667), and although not explicitly disclosed, it is well known that cladding layers have refractive indices of at least 1.4. Cladding layers having refractive indices of at least 1.4 improve optical coupling within the waveguide core region. Official notice has been taken for the limitation of a cladding (upper and/or lower) having an index of 1.4 or greater.

### ***Response to Arguments***

5. Applicant's arguments filed January 19, 2005 have been fully considered but they are not persuasive.

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Applicant traverses the rejections to claims 37, 38, and 40 to Hornbeck et al. '453 by stating that the reference does not teach gradual transitions. Applicant goes on to say that Hornbeck teaches "step transitions" in refractive index.

A dictionary definition of **gradual** is "*proceeding by steps or degrees*". As such, Applicant's claimed limitations are clearly, fully met by the Hornbeck et al. '453 reference, since a step change can be viewed as gradual. Further, Applicant's own claim language teaches these same "steps" (see claims 42-44, 96, 97, 99, and 100). Since Applicant claims infinitesimal "steps" ranging from 0.001 to 0.014, Applicant seems to hold the terms "gradual" and "step" as having different patentable weight than the terms "gradual" and "step" as construed by the Hornbeck et al. '453 reference. This argument is **not** persuasive. Step changes from 0.001 to 0.002 can be as *abrupt* (at least relatively) as a step change from 1 to 2.

Regarding claims 39, 41, and 45, Applicant has not asserted any convincing arguments to rebut the rejections under 35 U.S.C. 103 (a). Applicant is reminded that modifications must be novel or patentably distinct from the prior art. Each requirement of 35 U.S.C. 103 (a) is met in the rejections of claims 39, 41, and 45.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after


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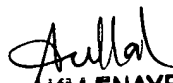
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Daniel Petkovsek  
March 28, 2005

  
AKM ENAYET ULLAH  
PRIMARY EXAMINER